Valter's Seven Forces; a Model for Analyzing the Forces Affecting the Business Model Innovation Process

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Abstract

Today's business environments are being subject to excrescent influence by new competing business models and ever increasing technological possibilities. This trend is unlikely to change in the near future. In fact, it would most likely just increase even more, therefor an successful embedded multi business model innovation processes within a business, would without any doubt be able to increase the likelihood for success for that business, therefore better understanding and measuring the multi business model innovation processes itself is of utmost importance. This paper propose the model Valter's Seven Forces. The model is intended for analyzing the dominating forces with high influence and effect on the business model innovation process, either positively or negatively, depending on the situation of the force. The Seven Forces in the model affect the probability for success of a business model innovation process. The affect from the forces can be either positive or negative depending on the situation. For instance, if the group dynamics contain conflicts and interpersonal power battles, the probability for success of the business model innovation process is affected negatively; however, if the group dynamics contain respect, collaboration and harmony, the probability for success of the business model innovation process is affected positively.

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Furthermore, this paper examines the engineering lab set-up with its laboratory measurement tools used at the Scandinavia Biogas2020 conference 2017 in Skive, Denmark to collect data regarding the business model innovation processes in three business model innovations laboratory environments. Students from Denmark, Norway and Sweden was involved in three multi business model innovation processes with three different real-life business cases.

Keywords: Valter's Seven Forces, Business Model, Business Model Innovation, Disruptive Business Models, Business Model Innovation Process.

1 Introduction

This paper has its solid theoretical foundation from previous research in business model innovation (BMI), and has its roots in previous published models and papers [1–5].

As illustrated in [6] through previously conducted research, the business environment today is highly competitive and subject to constant change, since new and continuously evolving business models are introduced and all BMs and BMES are under constant threat from disruptive BMs and disruptive BMES. Furthermore, the business environment today is subject to increasing numbers of new technology possibilities and the inner complexity from hostile takeovers, business reorganizations, joint ventures, organizational mergers etc. [7, 8].

To manage a business within such a BMES, it is of the utmost importance not only effectively to use information systems (IS) to lead and manage the business core BMs. It is also of the utmost importance to use the information systems to create business advantages that can ensure the business a strategic place in the future BMES. Also, it is important – via this use of Information Systems – to be able to meet the new Disruptive Business Models (DBM) before they enter the BMES or even to be able to create a new BMES.

This is posing a considerable challenge for today's management who has to deal with outdated legacy systems, incompatible systems built on different technologies with different data compliance and structure from business mergers etc. All of which makes the task increasingly harder to handle [9].

However, the increasing complexity in the BMES is only one factor that business today has to cope with. Another factor that needs to be taken into consideration is Moore's Law [10]. According to Moore's Law, the development in technology capabilities will not only continue but will do so at an ever-increasing rapid pace. Furthermore, the implication that technological advance means that managers are having difficulty in being aware of new

technologies that could be beneficial in their organizations [11] suggests that a scientific and methodologically structured approach is needed to overcome the challenges of the future.

In the process of seeking to overcome the challenges above, this paper takes a double loop learning [12] approach to BMI and focus on the forces affecting the BMI process either positively or negatively.

Firstly, we propose the model, Valter's Seven Forces, that with its seven forces; Environment and tools force; Coach force; Group force; Individual force; Competition Space force; Process Space force; Emotion force, propose a way of analyzing the dominating forces with high influence and effect on the business model innovation process.

Secondly, we developed and proposed the original engineering setup for measuring the BMI process, the engineering setup was tested at the Biogas2020 event in Skive (Denmark) on the 6–9 November 2017.

Finally, we make our conclusions and suggestion for future scope in the last Section 4. Conclusions and Future Scope.

2 Valter's Seven Forces

In this section we propose the model Valter's Seven Forces shown in Figure 1; the model is intended for analyzing the dominating forces with high influence and effect on the business model innovation process, either positively or negatively, depending on the situation of the force.

The seven forces in the model, Valter's Seven Forces, effect the probability for success of an innovation process. The effect from the forces can be either positive or negative depending on the situation. For instance, if the group dynamics hold conflicts and interpersonal power battles, the probability for the success of the innovation process is affected negatively. However, if the group dynamics are characterized by respect, collaboration and harmony, the probability for the success of the innovation process is affected positively. Each of the forces in the model are explained in the following:

2.1 Environment and Tools Force

The environment and tools available in the BMI process set the foundation for the BMI process. Whereas environment is seen as the surroundings of the BMI process, tools available are seen as the tools that the participants have access to during the BMI process to facilitate the process itself. As an example, by giving the participants access to tools like the Bee Board and the Bee Star at the Scandinavia Biogas2020 Conference 2017 the participants have a common

Figure 1 Valter's Seven Forces; a model for analyzing the BMI process.

and shared reference point. That not only facilitates the BMI process itself, but also facilitates an alignment of the participant in terms of the BM (Business Model) language used and thereby limiting the potential misunderstandings and their corresponding conflicts. Therefore, the BMI process itself at the Scandinavia Biogas2020 Conference 2017 has been positively affected with the infusion of the Bee Board and the Bee Star tools into the BMI process.

2.2 Coach Force

The ability of the coach to facilitate the BMI process affect the performance of the BMI process. A well prepared and supporting, knowable, educated coach will exert a positive influence on the BMI process. As an example, by having a coach educated in the tools like the Bee Board and the Bee Star and

the BMI process itself, the coach would be able to facilitate and instruct the participant about the correct usage of tools and share the understanding of the BMI process with the participant. This ensures the focus of the participant are directed towards the BMI process and not caught up in discussions about the tools or the understanding of the BMI process itself. Therefore, having a well-educated coach in the tools and the BMI process itself would positively affect the likelihood of a successfully BMI process.

2.3 Group Force

The group force is seen as all the group dynamics, conflicts, alignment, synergy etc. that happen naturally with any group formation. As an example, if you have a group of participants that quickly reach the performing stage in Tuckman's model of stages of group development [13], this would have a positive effect the BMI process and the probability for success. However, if you have a group of participants that's stuck a long time in the storming stage in Tuckman's model of stages of group development [13], this would have a negatively affect the BMI process and the probability for success.

2.4 Individual Force

The individual force is seen as all the forces that each participant possesses like personality, culture background, competence, area of expertise, etc. As an example, it would have a positive effect on the BMI process and the probability for success if you participants have a high level of competence and are experts within their area of expertise. However, poorly skilled participants would have a negatively effect on the BMI process and the probability for success.

2.5 Competition Space Force

The competition space force is seen as all the forces surrounding the BM under development or creation, one way of analyzing these forces is to use Porter's Five Forces Framework [14] as a tool for analyzing the competition. As an example, if the bargaining power of customers is very high in one competition space it would have a negatively effect on the BMI process and the probability for success. However, if you moved the BM to another competition space where the bargaining power of customers is very low, it would positive effect the BMI process and the probability for success.

2.6 Process Space Force

The process space force is seen as all the forces that affect the BMI process while it is being conducted. Such forces include the time available for the BMI process to be conducted. As an example, if the time available for the BMI process to be conducted is very limited, it would have a negatively effect on the BMI process and the probability for success. However, if you have the sufficient time required available for the BMI process, it would positive effect the BMI process and the probability for success.

2.7 Emotion Force

The emotion force is seen as the overall level of happiness within the BM process. An increase in happiness positively affects the capability to be creative and solve problems [15, 16]. As an example, if the participants are happy, they have an increased capability to be creative and solve problems that would positive effect the BMI process and the probability for success. However, if the participants are unhappy, they have a decreased capability to be creative and solve problems that would negatively affect the BMI process and the probability for success.

2.8 Possible Usage and Context Surrounding Valter's Seven Forces

An interesting aspect of Valter's Seven Forces model is that as the level of happiness affects a person's capability to be creative and solve problems, it follows logically that happiness within the BMI process positively affects the possibility for a successfully BMI process. With this in mind it should be possible to measure the level of happiness within the BMI process and to aim for as high a level of happiness as possible. This could be achieved by making changes in the environment or in the tools to positively influence the environment and tools force; by team building or conducting personalities test and replace team members to positively influence the group force; by building employee competences with courses to positively influence the individual force; by looking for other markets with the aim to positively influence the problem space; by training the coach to positively affect the coach force; or simply by assigning more time to the BMI process to positively affect the process space force.

If we compare Valter's Seven Forces model for analyzing the BMI process with today's research as e.g. the open Innovation model from Chesbrough, you will see that Valter's Seven Forces focuses on the direction of the BMs within

Figure 2 Placement of Valters's Seven Forces model within Chesbrough's Open Innovation model.

Chesbrough's model for open innovation. Henry Chesbrough coined the term "Open Innovation" which was defined in his book "Open Innovation: The New Imperative for Creating and Profiting from Technology" (2003) [17], where he looked at the innovation process and created models with stages, barriers and boundaries. In the book Chesbrough explains how companies have shifted from so-called closed innovation processes towards a more open way of innovating in Figure 2 the placement of Valters's Seven Forces model within Chesbrough's Open Innovation model is graphically shown.

3 Engineering Setup & Laboratory Experiments

In this section we first develop and propose the original engineering setup for measuring the BMI process, the engineering setup proposed can measure heart-rate, face image for emotion detection on each participant, CO₂, temperature humidity, pressure in the environment of the lab, 360° live video streaming and sound recording of the group working in the lab. After developing the engineering setup, the engineering setup was tested at the Biogas2020 event in Skive (Denmark) on the 6–9 November 2017.

3.1 Introduction

At the Biogas2020, three multi business model innovation challenges were posed.

Figure 3 Overview of the set-up of the multi business model innovation labs at the Biogas2020 event in Skive (Denmark).

Each of the multi business model innovation challenges had a group of approximately four participants that worked with their own specific real-business Technological Business Model Innovation (TBMI) challenge defined by a business. The participants worked with the challenge for three days within a multi business model innovations challenges lab tailored specifically to enhance multi business model innovation. Within each of the three multi business model innovation labs, the multi business model tools Bee Board and Bee Star developed by Professor Peter Lindgren were available [18] All the multi business model innovation labs were set up in a large hall as shown in Figure 3.

3.2 The TBMI Challenges

Each of the three TBMI challenges was defined as a challenge to develop business models related to biogas. All the groups were mixed with participant from Denmark, Norway and Sweden and with mixed competences/background. Each of the groups was given a real-business challenge to work with. One group was to work with a business case from Thise Mejeri (Thise Dairy); another group was to work with a business case from Veas, and the last group was to work with a business case from Sweden (West Coast Smolts). The three challenges and their corresponding multi business model innovation processes were undertaken inside the three multi business model innovation labs.

Figure 4 One of the multi business model innovation labs shown from the inside.

Figure 4 shows one of the labs seen from the inside. The Bee Board multi business model innovation tool is mounted on the wall, and the Bee Star multi business model innovation tool is placed on the table.

3.3 Engineering Setup & Laboratory Measurements

In this section, the technology tools used to measure the multi business model innovation process is described. The section is divided into three sub sections. The first sub section is the Environment Measurement section that describes the sensors required to measure the environment in the three multi business model innovation labs. The second sub section is the Group Measurement section that describes the sensors required to measure the group as a whole during the multi business model innovation process. The third sub section is the Personal Measurement section which describes the sensors required to measure a person during the multi business model innovation process. Preferably, all the participant would conduct the BMI process while wearing EEG (electroencephalography) equipment that measures the electrical activity of the brain via electrodes that are placed on the scalp or in a functional magnetic resonance imaging (fMRI) scanner that measures the brain activity indirectly. However such type of measurement would interfere with the participant degree of freedom and limit the possibility for groupwork in the process on an unacceptable level, to protect the BMI process from equipment

that would interfere on an unacceptable level the following set of rules were made:

Rule number 1, all the equipment that the participants needs to wear have to be completely wireless and run on batteries to ensure the participant freedom to interact.

Rule number 2, all of the equipment needs to be non-Invasive.

Rule number 3, if the equipment interferes with any of the senses of the participant, the value of the measurement should be carefully evaluated up against the level of interferes it creates.

Figure 5 Engineering setup in the multi business model innovation lab.

Rule number 4, the actual measurement should give a relatively precise and meaningfully purpose related to understanding the BMI process and be carefully weighed against the resources, time and founding available for this research.

In the process of staying in compliance with all four rules, the list of possible equipment was getting shorter for each rule, the final list of equipment is described in the next three sections, environment measurement, group measurement and personal measurement.

In Figure 5 and in compliance with the four rules, the engineering setup in the multi business model innovation lab, is shown with a diagram.

3.3.1 Environment measurement

The following environmental measurements were collected inside each multi business model innovation lab:

- CO₂ level approximate every second.
- Temperature approximate every second.
- Humidity approximate every second.
- Pressure approximate every second.

3.3.2 Group Measurement

The following group measurements were collected inside each multi business model innovation lab:

- 360 Degree camera live streaming
- Live sound recording

3.3.3 Personal Measurements

The equipment to collect the personal measurements were implemented as part of the experiment. An emotion recognition cap with a camera directed towards the participant's face producing approximately one picture per second, see Figure 6 where the participants wearing the emotion recognition cap while deeply involved in the multi business model innovation process. For live sampling, approximately every fifth photo was run through face detection algorithms and post-processed with emotion detection algorithms before the live sampling results were displayed and archived, see Figure 7 where the captured images from the emotion recognition caps and the results on the Node-RED dashboard for one of the multi business model innovation labs are shown. Furthermore, each participant was fitted with pulse measurement equipment strapped around their chest to measure the heart rates of the

Figure 6 Participants wearing the emotion recognition cap while deeply involved in the multi business model innovation process.

participants. Before any measurement was taken, each participant was asked to complete an insights[®] discovery personal profile. In the subsequent three sections the following are discussed in greater detail: the insights[®] discovery personal profile, the emotion recognition cap and the heart rate measurement.

4 Summary and Future Research

Firstly, the model “Valter’s Seven Forces” has been developed (Figure 1), the model is intended for analyzing the dominating forces with high influence and effect on the business model innovation process, either positively or negatively, depending on the situation of the force. The Seven Forces in the conceptual model affects the probability for success of an innovation process. The effect of the forces can be either positive or negative depending on the situation. For instance, if the group dynamics comprise conflicts and interpersonal power battles, the probability for the success of the innovation process is affected negatively. However, if the group dynamics hold respect, collaboration and harmony, the probability for the success of the innovation process is affected positively.

The next step on the scientific research journey was to find a way to measure the BMI process. Before it was possible to measure anything, however, the sensors available for measuring had to be investigated and decided upon. After

Figure 7 The captured images from the emotion recognition caps and the results on the Node-RED dashboard for one of the multi business model innovation labs.

the process of selecting the sensors for measuring, the engineering set-up (Figure 5) to be used in the multi business model innovation lab had to be developed.

After the engineering set-up for use in the multi business model innovation labs were proposed and fully developed, the next step on the journey was to empirically test the engineering set-up. This was done at the Scandinavia Biogas2020 Conference 2017 where three multi business model innovation labs were empowered with the proposed engineering lab set-up. At the conference, we collected data regarding the multi business model innovation processes in the three business model innovation laboratory environments. The data collection was conducted over a time span of three days. Based on the quality and consistency of the data collection, it is clear, that it is not tedious, but it is possible to measure the forces in Valter's Seven Forces with the help of IT sensors and equipment.

4.1 Future Research

It is suggested that even more empirical studies are made around the forces affecting the BMI Process. Our empirical studies in this paper had the primary focus on the Individual force; the Group force; the Environment and tools force, and the Emotion force, other studies that also primarily includes the Coach force; the Process space force and the Competition space force, should

be conducted to get an even better understanding about the forces affecting the BMI Process.

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Biographies

Per Valter holds a Assistant Professor position at Department of Business Development and Technology, Aarhus University, Denmark. Where his main research field areas are Digitization of Business Models and Entrepreneurship and Multi Business Model Innovation and Technology Experimental Interaction in relation to Digitalization of Business Models. He has successfully been founding several startup companies and grown them to exit's stage and was awarded "Børsen Gazelle" in 2013 and 2014 for creating and leading one among the fastest growing companies in Denmark, in addition to these business achievements he is a Graduate in Computer Science and holds an Executive MBA – Master in Management of Technology and an MSc in Business and Management Research at Henley University of Reading and are currently Doctor of Business Administration Programme Member at Henley Business School University of Reading, He is an experience teacher on

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Peter Lindgren is Professor of Innovation and New Business Development at the Center for Industrial Production, Aalborg University, Denmark. He holds B.Sc. in Business Administration, M.Sc. in Foreign Trade and Ph.D. in Network-based High Speed Innovation. He has (co-)authored numerous articles and several books on subjects such as product development in network, electronic product development, new global business development, innovation management and leadership, and high speed innovation. His current research interest is in new global business models, i.e. the typology and generic types of business models and how to innovate them.

Ramjee Prasad is a Professor of Future Technologies for Business Ecosystem Innovation (FT4BI) in the Department of Business Development and Technology, Aarhus University, Denmark. He is the Founder President of the CTIF

Global Capsule (CGC). He is also the Founder Chairman of the Global ICT Standardization Forum for India, established in 2009. GISFI has the purpose of increasing the collaboration between European, Indian, Japanese, North-American and other worldwide standardization activities in the area of Information and Communication Technology (ICT) and related application areas. He has been honored by the University of Rome "Tor Vergata", Italy as a Distinguished Professor of the Department of Clinical Sciences and Translational Medicine on March 15, 2016. He is Honorary Professor of University of Cape Town, South Africa, and University of Kwa-Zulu-Natal, South Africa. He has received Ridderkorset af Dannebrogordenen (Knight of the Dannenberg) in 2010 from the Danish Queen for the internationalization of top-class telecommunication research and education. He has received several international awards such as IEEE Communications Society Wireless Communications Technical Committee. Recognition Award in 2003 for making the contribution in the field of "Personal, Wireless and Mobile Systems and Networks," Telenor's Research Award in 2005 for impressive merits, both academic and organizational within the field of wireless and personal communication, 2014 IEEE AESS. Outstanding Organizational Leadership Award for: "Organizational Leadership in developing and globalizing the CTIF (Center for TeleInfrastruktur) Research Network," and so on. He has been Project Coordinator of several EC projects namely, MAGNET, MAGNET Beyond, eWALL and so on. He has published more than 40 books, 1000 plus journal and conference publications, more than 15 patents, over 100 Ph.D. Graduates and a more substantial number of Masters (over 250). Several of his students are today worldwide telecommunication leaders themselves. Under his leadership, magnitudes of close collaboration are established among premier universities across the globe. The partnerships are regulated by guidelines of the Memorandum of Understanding (MoU) between the collaborating universities.